



## Natural Resource Conservation Service Los Lunas Plant Materials Center 2017 Progress Report of Activities

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### National Cover Crop Adaptation Trial

In 2016, the Los Lunas Plant Materials Center (PMC) installed the *NRCS Plant Materials Program National Cover Crop Adaptability Trial*. This trial is a two-year Plant Materials Program study to examine the adaptability of eight important annual winter cover crop species in different geographical regions at PMC's across the country. Data collected includes: germination and field emergence, spring green-up, bloom and flowering period, plant height, winter hardiness, disease and insect resistance.

**Black oats (*Avena strigosa*)** can be grown for grain or forage, and as a rotational cover crop alone or as part of a mix. It is able to cycle N superior to cereal rye owed to its lower C:N ratio. Black oats exudate compounds that can suppress weed seed germination and establishment.

**Cereal rye (*Secale cereale*)** can be grown for grain or forage, and cover. It produces large volumes of biomass and its long roots are able to scavenge for excess N and K for subsequent crops. It matures in early spring. It produces phenolic and benzoic acids that prevent weed seed germination.

**Hairy vetch (*Vicia villosa*)** fixes large amounts of nitrogen, grows early in the spring and outcompetes weeds owed to its dense growth. It can be grazed or harvested as forage.

**Austrian winter pea (*Pisum sativum* L.)** can be grown for forage or as a rotation crop owed to its ability to disrupt disease and pest cycles, provide nitrogen, improve soil microbe diversity, and attract pollinator species. Austrian winter pea is edible and nutritious.

**Daikon radish (*Raphanus sativus*)** forms a napiform root that can penetrate up to 4 feet in depth to break up soil compaction and provide for aeration and rainfall accumulation. It is pollinated by bees and the root is edible.

**Balansa clover (*Trifolium michelianum* Savi)** is a superior re-seeder and is well-adapted to a wide range of soil types. It is an early spring N source.

**Crimson clover (*Trifolium incarnatum*)** provides habitat and nectar for beneficial insects and is able to grow in many different soil substrates. It is also used as a green manure, inter-row cropping and silage mixes.

**Red clover (*Trifolium pretense*)** is the exception from the other cover crops tested because it can also be a biennial or short-lived perennial depending upon where it is grown in NM. It is a good choice for orchards because it attracts beneficial insects and is flood tolerant.

### Performance Highlights

The potential benefits of cover crops are numerous; yield enhancement from improved soil health, prevention of soil erosion, weed suppression, habitat for beneficial insects, agricultural use reduction, increase in rainfall penetration, disruption of disease and pest cycles. This abbreviated report highlights three cultivar characteristics; biomass production respective to mean height, timing of nitrogen fixation of the leguminous species relative to 50% bloom, and adaptation to a flood irrigated, clay loam substrate. The cultivars were sown on September 27, 2016.

**Table 1. Mean height, date of 50% anthesis, and survival % for black oats and cereal rye cultivars at the NMPMC (2017).**

Species	Cultivar	Mean ht. (in)	50% Anthesis	Survival (%)
<b>Black oats</b>	Cosaque	35.5	4/27/17	100
	Soil Saver	24.5	4/19/17	48.0
<b>Cereal rye</b>	Aroostook	28.3	3/24/17	100
	Bates	32.3	3/24/17	97.9
	Brasetto	34.5	4/13/17	96.9
	Elbon	27.3	3/27/17	98.8
	FL 401	23.0	3/27/17	76.0
	Guardian	30.0	4/16/17	100
	Hazlet	36.0	4/10/17	100
	Maton	31.8	3/24/17	98.9
	Maton II	33.0	3/24/17	99.0
	Merced	20.3	3/27/17	97.5
	Oklon	40.5	3/27/17	97.5
Rymin	35.0	4/10/17	98.7	
Wheeler	38.3	4/10/17	100	
Wintergrazer	32.8	3/24/17	95.0	
Wrens	30.8	3/27/17	97.6	
Wrens Abruzzi	30.7	3/27/17	97.6	

**Table 2. Mean height, 50% bloom and survival % for hairy vetch, Austrian winter pea, and balansa clover at the NMPMC (2017).**

Species	Cultivar	Mean ht. (in)	50% Bloom	Survival (%)
<b>Hairy vetch</b>	CCS-Groff	16.8	5/11/17	87.8
	Lana	0.0		0.0
	Purple Bounty	18.3	4/27/17	100
	Purple Prosperity	16.8	5/1/17	100
	TNT	16.8	5/1/17	97.8
	Villana	14.3	5/9/17	97.8
	Brasetto	34.5	4/13/17	96.9
<b>Austrian winter pea</b>	Arvica 4010	16.3	3/16/17	98.5
	Dunn	5.5	3/20/17	8.4
	Frost Master	5.5	3/20/17	32.3
	Lynx	7.7	3/20/17	25.0
	Maxum	12.8	3/16/17	100
	Survivor 15	17.0	3/14/17	63.1
	Whistler	10.0	3/14/17	71.4
	Windham	62.3	3/16/17	60
<b>Balansa clover</b>	Fixation	8.0	4/19/17	100
	Frontier	2.0	3/21/17	100



**Daikon radish napiform roots of Sod Buster right and Graza left**

**Table 3. Mean height, 50% bloom and survival % for red clover, crimson clover and daikon radish at the NMPMC (2017).**

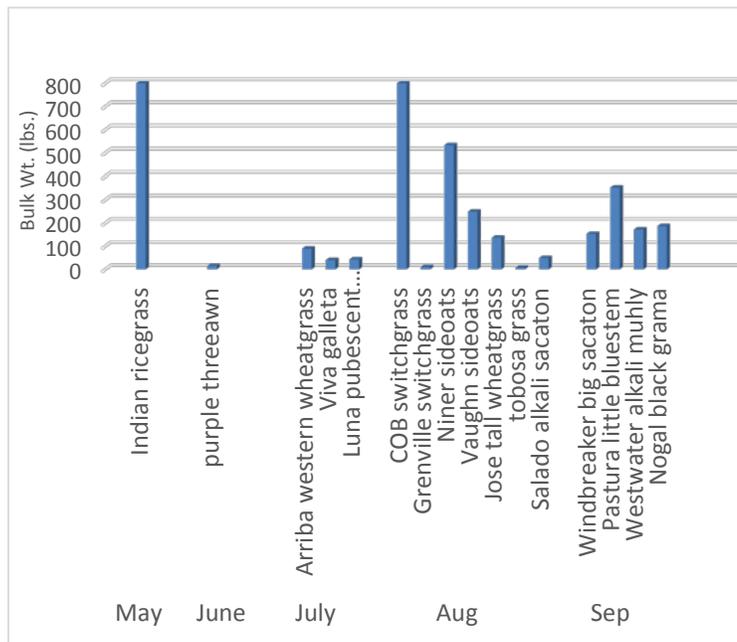
Species	Cultivar	Mean ht. (in)	50% Bloom	Survival (%)	
<b>Red clover</b>	Cinnamon Plus	9.5	5/16/17	97.6	
	Cyclone II	15.3	5/17/17	98.9	
	Dynamite	15.5	5/14/17	98.8	
	Freedom	10.3	5/17/17	98.4	
	Kenland	14.0	5/13/17	97.0	
	Mammoth	7.3	3/29/17	100	
	Starfire	13.5	5/16/17	97.4	
	Wildcat	13.3	5/11/17	98.4	
	<b>Crimson clover</b>	AU Robin	8.3	4/6/17	100
		AU Sunrise	9.5	3/31/17	100
AU Sunup		4.0	3/23/17	65.6	
Contea		7.3	4/11/17	92.7	
Dixie		8.5	4/10/17	100	
Kentucky Pride		7.5	4/18/17	100	
<b>Daikon radish</b>	Big Dog	14.5	3/27/17	100	
	Concorde	21.5	4/8/17	100	
	Control	25.8	4/1/17	100	
	Defender	23.0	3/30/17	100	
	Driller	16.3	3/2/17	100	
	Eco-till	12.8	3/24/17	100	
	Groundhog	11.8	3/27/17	100	
	Lunch	13.3	3/22/17	100	
	Nitro	14.0	3/23/17	100	
	Tillage	12.3	3/24/17	100	
Sod Buster	13.8	3/30/17	100		
Graza	21.0	4/10/17	100		

**Additional Resources**

- <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>
- <http://edis.ifas.ufl.edu/pdffiles/AA/AA13100.pdf>
- [https://efotg.sc.egov.usda.gov/references/public/NM/Cover\\_Crop\\_Termination\\_Guidelines-Dec\\_20\\_2013.pdf](https://efotg.sc.egov.usda.gov/references/public/NM/Cover_Crop_Termination_Guidelines-Dec_20_2013.pdf)

## Foundation and Breeder Seed Production

The New Mexico Plant Materials Center (NMPMC) delivers products to our customers that address conservation concerns within the Los Lunas Plant Materials Center service area: Southeast Colorado, New Mexico, Southeast Utah, Southwest Texas, and Northeast Arizona. To enhance conservation methodologies, the NMPMC develops improved species and conservation techniques to mitigate gully erosion, revegetate disturbed lands, reduce erosion, and increase rangeland and cropland productivity. The seed produced includes both warm- and cool-season grasses, totaling 19 foundation production fields. A total of 3,968 pounds of bulk seed was harvested in 2017.



## Cutting Block Production

The following riparian poles and whips are available upon request:

Rio Grande cottonwood,  
 narrowleaf cottonwood,  
 eastern cottonwood,  
 Fremont cottonwood,  
 Goodding's willow,  
 and coyote willow.

The PMC staff can provide technical assistance for cutting block establishment for any interested producer or partner.

## Cooperative Seed Production

NRCS Plant Materials Centers nationwide have cooperatively tested and increased native plant materials via a memorandum of understanding with the National Park Service using interagency agreements since 1989.



Purple threeawn (*Aristida purpurea*) seed increase field  
 Glenn Canyon NRA



Indian ricegrass (*Achnatherum hymenoides*) seed  
 increase field Arches National Park

### Assistance from Field Offices

Our mission is to develop, test, and transfer plant science technology to meet customer and natural resource needs. The NMPMC needs a total of 30 collections of tobosa grass (*Plueraphis mutica*) and blowout grass (*Redfieldia flexuosa*) to evaluate and test. If you are able to assist us in the collection process please e-mail the manager to receive collection protocols and envelopes for mailing.

**Your assistance is greatly appreciated!**

# Los Lunas PMC Technology Transfer

## Presentations



Bernadette presenting *Improving Soil Health through Cover Cropping* at the NEDC's Soil Health Training Course at NMPMC on August 23, 2017.

- *Healthy Soil, Food and You; Local Action with a World View* at the bi-annual Field Day. 15 August 2017. Los Lunas, NM.
- *Native Plant Propagation* provided to the Santa Clara Pueblo Forestry Department. 17 January 2017. Los Lunas, NM.
- *Soil Health and the National Cover Crop Adaptation Study Performance Results* provided to NRCS staff, partners and producers. 6 September 2017. Los Lunas, NM.
- *The Importance of Soil Biota and Plant Polyploidy in Land Management* at the BLM-SOS Conference. 28 February 2017. Monticello, UT.

## Workshops



*Techniques for Optimizing Success of Riparian Plantings.* Demonstration of the installation of a water monitoring well at the Santo Domingo Pueblo planting site on February 15, 2017.

- Orientation to Seed Cleaning provided to the staff of the Institute of Applied Ecology. 12 January 2017. Los Lunas, NM.
- Soil Health and Cover Cropping provided to New Mexico field and technical staff, partners and producers. 5 April 2017. Los Lunas, NM.

The NMPMC provides trainings that facilitate best management conservation practices. We strive to increase and strengthen our current collaborative partnerships with NRCS field and technical staff. If your team could benefit from a tour, presentation or workshop facilitated by the NMPMC, please let us know.

The Natural Resources Conservation Service Los Lunas Plant Materials Center is one of 25 federally funded Centers nationwide. The NMPMC is operated under a contribution agreement with New Mexico State University in which we share 207 acres. The acreage we operate includes production of Foundation Seed, riparian cutting blocks, testing and selection of potential releases, evaluation studies in support of Field and Technical Staff, as well as production fields for partners that lack seed production infrastructure.



Arial view of the Los Lunas Plant Materials Center

Originally, from 1937 to 1952 the NMPMC was located north of Albuquerque by the Sandia Indian Reservation. In 1957, the center was re-located to its present location. The NMPMC serves several major land resource areas that have in common characteristics of climate, topography, soil and water resources. Our service region includes Southeast Colorado, New Mexico, Southeast Utah, Southwest Texas, and Northeast Arizona. Our mission is to develop, test, and transfer plant science technology to meet customer and natural resource needs. We also provide trainings that facilitate best management conservation practices.

We strive to increase and strengthen our current collaborative partnerships with NRCS field offices, public agencies, universities, conservation organizations, tribes, commercial seed producers and nurseries. Together we can determine the conservation plants and techniques that will succeed.

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## Technical Documents

The following release brochures have been updated and can be accessed by the following website link:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/mc/west/nmpmc/cp/>

- ‘Grant’ cane bluestem (*Bothriochloa barbinoides*)
- ‘Llano’ Indian ricegrass (*Sorghastrum nutans*)
- ‘Lovington’ blue grama (*Bouteloua gracilis*)
- ‘Niner’ sideoats grama (*Bouteloua curtipendula*)
- ‘Noga’ black grama (*Bouteloua eriopoda*)
- ‘Redondo’ Arizona fescue (*Festuca arizonica*)
- ‘Salado’ alkali sacaton (*Sporobolus airoides*)
- ‘Tusas Germplasm’ bottlebrush squirreltail (*Elymus elymoides*)
- ‘Elida’ sand bluestem (*Andropogon hallii*)
- ‘Pastura’ little bluestem (*Schizachyrium scoparium*)
- ‘Vaughn’ sideoats grama (*Bouteloua curtipendula*)

In addition, the following publications also are available from the website:

- *Arriba western wheatgrass (Pascopyrum smithii (Rydb.) A. Love) Morphological Evaluation of 8 Germplasm Sources*, Final Study Report.
- *Establishment of Pollinator Plants by Direct Seeding in Flood Irrigation Fields at the Los Lunas Plant Materials Center*, Final Study Report
- *Milkweed Seed Production Trials for the Xerces Society*, Final Study Report
- *Pollinator Plant Recommendations for New Mexico*, Technical Note No. 71 (Final Revision)
- *New Mexico Seed Laws and Regulations*, Technical Note No. 74
- *‘Windbreaker’ Big Sacaton for Use in Herbaceous Barriers and as Vegetative Mulch*, Technical Note No. 73
- *‘Windbreaker’ Big Sacaton: A Bio-Energy Forage Source*, Technical Note No. 72

## Los Lunas Plant Materials Center Staff

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